



 CALIFORNIA STATE UNIVERSITY, SAN BERNARDINO

**CYBERSECURITY CENTER**



# EXECUTIVE DIRECTOR



## TONY COULSON

Tony Coulson, Ph.D., is the executive director of the Cybersecurity Center and professor of Information and Decision Science in the Jack H. Brown College at California State University, San Bernardino (CSUSB). During his tenure at CSUSB, Tony has led more than 20 grant-funded cybersecurity projects totaling over \$18 million. Dr. Coulson also led the establishment of a nationally acclaimed cybersecurity program that spans business, computer science, national security studies, criminal justice, and public administration. The program is designated as a Center of Academic Excellence (CAE) in Cyber Defense Education by the National Security Agency (NSA) and Department of Homeland Security (DHS).

Dr. Coulson is a globally recognized cybersecurity expert and leads the CAE Community in Cybersecurity Community ([caecommunity.org](http://caecommunity.org)) as a CAE National Resource Center for over 200 colleges and universities. He has consulted on cybersecurity issues for Congress, federal agencies, and private organizations. He belongs to several boards and has won numerous academic, national, and community awards.

Prior to his academic career, Dr. Coulson had a successful industry career for over 17 years as an executive and an entrepreneur, starting his first successful technology business when he was 14 years old. He holds a Ph.D. in Management Information Systems from Claremont Graduate University.

# DIRECTOR



## VINCENT NESTLER

Vincent Nestler, Ph.D., is the director of the Cybersecurity Center and professor of Information and Decision Science in the Jack H. Brown College at CSUSB. He holds a doctoral degree in instructional design, a master's degree in network security from Capitol Technology University, and a Master of Advanced Technology from Columbia University. He is the author of the *Principles of Computer Security Lab Manual*. Dr. Nestler is a network engineering consultant and technical trainer with over 20 years of experience in network administration and security. He served as a Data Communications Maintenance Officer in the U.S. Marine Corps Reserve. During his service, he designed and implemented the training for Marines assigned to the Defense Information Systems Agency (DISA)

Computer Emergency Response Team. He also served as the Assistant Operations Officer (training) for the Joint Broadcast System, during its transition to DISA.

Since 2007, Dr. Nestler has been integral to training CyberCorps® students at Idaho State University and at California State University, San Bernardino. He is the principal investigator for the NICE Challenge Project ([nice-challenge.com](http://nice-challenge.com)) – serving over 350 schools nationwide. The NICE Challenge Project develops real-world, hands-on scenarios that provide students with cybersecurity workforce experience before joining the workforce. Currently he is an assistant professor at California State University, San Bernardino. Dr. Nestler has held numerous professional certifications, including Security+, Network+, A+, ACE, MPE, MCSE, MCT, RHCE, and others. He has over 25 years of experience teaching and has been instrumental in developing a wide range of curriculum, from grade school to secondary education, higher education, and graduate school.



# NATIONAL LEADER IN CYBERSECURITY EDUCATION



**"Ranked one of the top programs in the world for cybersecurity higher education"**

**—digitalguardian.com**

As a leader in cybersecurity education, CSUSB's prestigious academic program earns national attention from both government and industry. CSUSB has been selected as a CAE National Resource Center (CNRC) in Cybersecurity Education by the NSA, making it one of only three schools with this prestigious achievement, and it has been designated as a Center of Academic Excellence (CAE) in Cyber Defense by the NSA/DHS since 2015.





As one of three CNRCs in the country, CSUSB provides numerous resources and services to the CAE in Cybersecurity Community, supporting the mentorship of hundreds of CAE-designated schools through their designation process. The number of designated CAE schools has soared by more than 100% since 2014, and an ever-increasing number of cybersecurity professionals have graduated into the workforce every year. More than 80% of participants in middle and high school outreach programs have reported increased interest in cybersecurity education and careers, and 91% report increased interest in attending college.

Using our position as a national leader in cybersecurity education, our program at CSUSB has had a strong impact on the national shortage of cybersecurity professionals in the U.S. workforce. By addressing every aspect of the cyber education pipeline from K-12 to the workforce, we have placed ourselves in a leadership position to effect significant change by expanding the national cybersecurity workforce.

**"Students from... the Inland Empire will be on the front lines of the cyberwarfare that's defining our modern defense capabilities."**

**—Pete Aguilar, U.S. Representative, California's 31st Congressional District**

# CYBERCORPS® SCHOLARSHIP FOR SERVICE

Serving as a national model, CyberCorps® is CSUSB's scholarship program focused on increasing the number of cyber professionals in government employment. Students participate in professional development, competitions, certifications, service outreach, and projects.

## A FEW NUMBERS TO LOOK AT...

**\$700,000**

given annually to scholarship recipients

**100%**

go into government employment

**\$50K - \$80K**

awarded to each student

**2 YEARS**

full tuition, books, and stipend

**2 YEARS**

federal employment upon graduation

**FUNDED BY THE NATIONAL  
SCIENCE FOUNDATION**







From 2009 to 2018, the college has given **OVER \$6 MILLION** in scholarships through the National Science Foundation grant CyberCorps®: Scholarship for Service.

**"My current work role is... trying to communicate cybersecurity to people that might not understand it, which the program at CSUSB really prepares you for - I'll call it cyber-translating."**

**–Program Alum**

**48%** of scholarship recipients come from underrepresented populations

**40%** of CyberCorps® scholarship recipients at CSUSB are women

**94** total scholarship recipients at CSUSB since 2009

DATA FROM 2016-2018

# NICE CHALLENGE PROJECT



**"The students, and myself, were delighted at the humor and realism in the first challenge we tackled. It was a challenge... rooted in the real world rather than the step-by-step guided labs they had seen before."**

**–Eric Waterkotte, Peninsula College**

Designed for **INDUSTRY, GOVERNMENT, and EDUCATION**, hosted at CSUSB, the NICE Challenge Project has over **350** registered educational institutions. It develops real-world cybersecurity challenges within virtualized business environments that bring students workforce experience before the workforce. Its goal is to bring the most realistic experiences to students, at scale year round, while also generating useful assessment data about their knowledge, skills, and abilities for educators.

## Revolutionizing Cyber Learning and Assessments

Cyber challenge labs emphasize problem-solving, self-learning, and documentation over following step-by-step instruction and limited simulations.

The NICE Challenge Project is a grant project managed and staffed by the 501(c)(3) non-profit University Enterprises Corporation (UEC) in partnership with California State University, San Bernardino.





<https://nice-challenge.com>



The NICE Challenge Project is only possible through its three-pillar approach to developing and delivering challenges. Together these pillars create a tight, vertically integrated, technical solution that is imperative to delivering real-world challenges at scale to students across the United States.



Platform



Environment



Challenges

**Platform** - A powerful cross-platform web application where users can deploy challenges, access VMs, manage accounts, and review challenge results, all without any installers or downloads.

**Environment** - Full-scale, context-rich business environments tailored around NICE Framework categories. Each environment includes a fully staffed fictional business organization in addition to its desktops, servers, and networks.

**Challenges** - Competency-based assessments focused on real-world problems and context, designed to capture useful data for actionable metrics. Each challenge is mapped to the NICE Framework Tasks, Work Roles, KSAs (Knowledge, Skills, and Abilities), and CAE KUs (Knowledge Units).



**NIST**

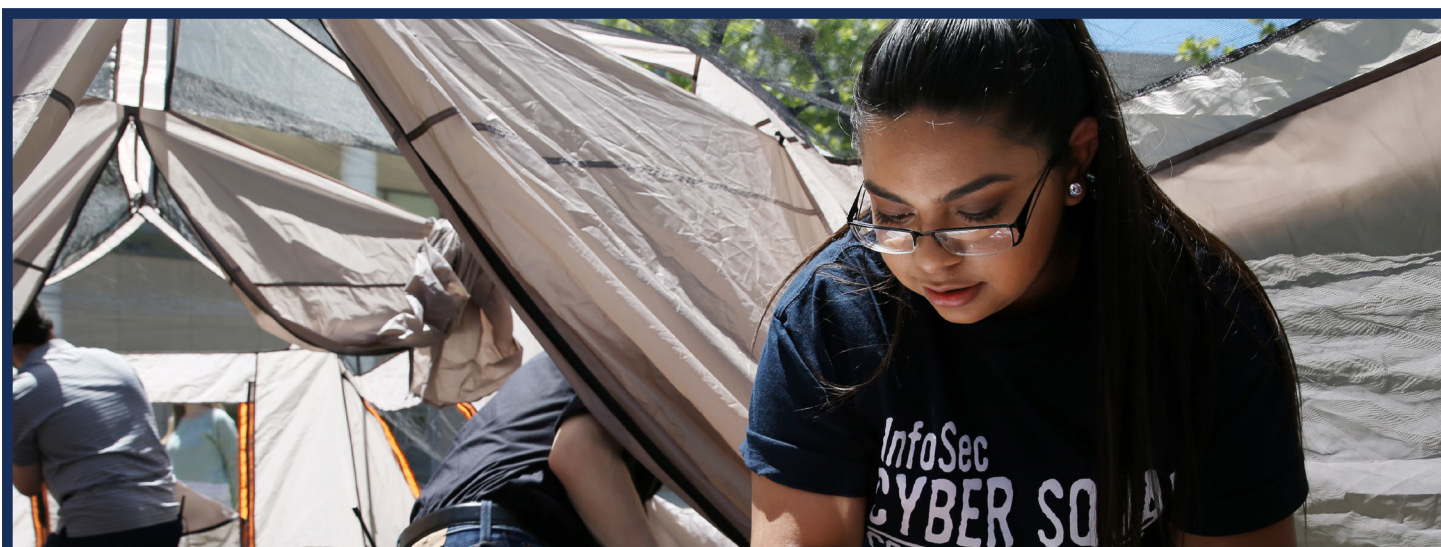
# OUTREACH

Outreach and recruitment for the Cybersecurity Center continues to grow. CSUSB students involved in the Information Security Club's **Cybersecurity Awareness Squad** continue to demonstrate their latest technology projects while promoting ethical computer practices and internet safety throughout the community. CyberSquad members engage in more than 20 annual cyber-related and career-guiding activities in the community, from elementary schools to college, local business professionals, and retirement homes.

Our students strengthen their public speaking and presentation skills by leading events that display our cutting-edge projects including drone research and engineering, car hacking, an R.C. cloud-based rover, forensics, surveillance, IoT (Internet of Things) toys, Collegiate Cyber Defense Competition (CCDC), Gadgeteer, emergency communications, open-source intelligence, ethical hacking, and more. We've opened our doors to the public, hosting campus tours for schools of all levels to visit and explore our information security lab, discuss cyber topics, and hear testimony and guidance from our passionate student leaders.







Students in the Emergency Communications Project set up for a disaster response scenario.

The immeasurable impact that CyberSquad has made on the community is observed through the rapidly growing interest in information technology, an increase in cybersecurity graduates, and the growing attention from government agencies and talent-seeking tech industry leaders like Google, Facebook, and Argonne National Laboratory.

## SINCE 2015...

**21,000+** individuals served (K-12 & local community)

**156,387** volunteer hours served

**375** participating student volunteers

DATA FROM 2015-2018

**InfoSec**  
INFORMATION SECURITY CLUB  
California State University, San Bernardino  
<https://www.infosec-csusb.org>

# GENCYBER

GenCyber is a free, one-week, immersive summer camp for middle and high school girls, funded by a grant from the National Security Agency and sponsored by the National Science Foundation, Facebook, Girl Scouts of San Geronimo Council, Silicon Valley Community Foundation, Google, IBM, USBank, Cyber SB Center of Learning, ConvergeOne, Bank of America, CISCO, Northrop Grumman, San Manuel Indian Bingo & Casino, Staples, and the U.S. Department of Homeland Security. The students participate in drone security, forensics, cyber hygiene, CyberPatriot, basic programming, team-building, white hat hacking, and more. Between 2015-2019, **1,287** girls from the local community have participated at CSUSB's GenCyber Camp.



**"My daughter is really interested in pursuing a career in cyber hacking prevention. GenCyber has created a spark in her spirit. This program has given her a huge amount of confidence."**

**—GenCyber Parent**

GenCyber is a grant project managed and staffed by the 501(c)(3) non-profit University Enterprises Corporation (UEC) in partnership with California State University, San Bernardino.





The Girl Scouts of San Geronio Council and the Cybersecurity Center partner together to host this free annual camp. Each year, **250** girls from San Bernardino and Riverside counties learn about career and academic opportunities offered at CSUSB.

**\$210,000**

total cost of one-week camp

**81%**

increased interest in cyber-related fields

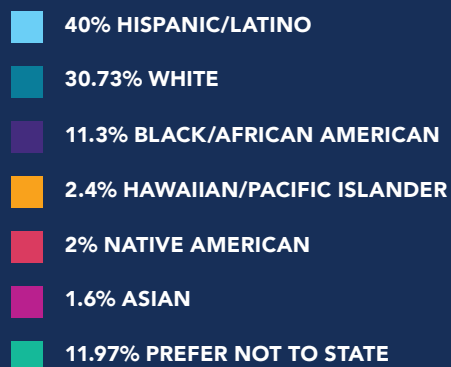
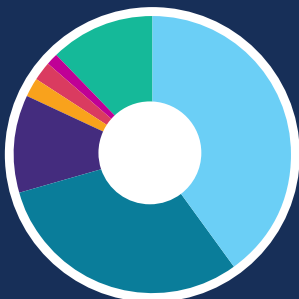
**91%**

increased interest in attending college

DATA FROM 2016-2018



## DEMOGRAPHICS



DATA FROM 2016-2018

# CAE IN CYBERSECURITY COMMUNITY

The National Centers of Academic Excellence (CAE) in Cybersecurity Program, run by the NSA and DHS, designates schools that meet rigorous CAE curriculum and staffing requirements. CSUSB received its CAE designation in 2008, becoming one of four CAE National Resource Centers (CNRC) in the nation in 2016. As a CAE-CNRC, CSUSB is responsible for the maintenance of the CAE in Cybersecurity Community.

The CAE in Cybersecurity Community provides for the fruitful exchange of relevant information, ideas, and events by CAE Institutions for CAE Institutions through weekly newsletters, web conferencing platforms, and by hosting the annual symposium for existing CAEs and applicants.



## CAE in Cybersecurity Virtual Career Fair Sponsored by CWW and NSF

Since 2017, the CAE in Cybersecurity hosted an annual National Cybersecurity Virtual Career Fair for students of CAE-designated institutions. Students, alumni, and faculty from CAE-designated institutions across the nation are allowed to participate in the career fair for free. Since 2017, over 2,500 students and over 50 employers have participated in the virtual career fair.

## CAE in Cybersecurity Symposium

The CAE Symposium is designed to provide CAE Community members and applicants the opportunity to network, receive community updates, and present their research to the community. The symposium is open to all existing CAE-CD/CAE-CO institutions and applicants.



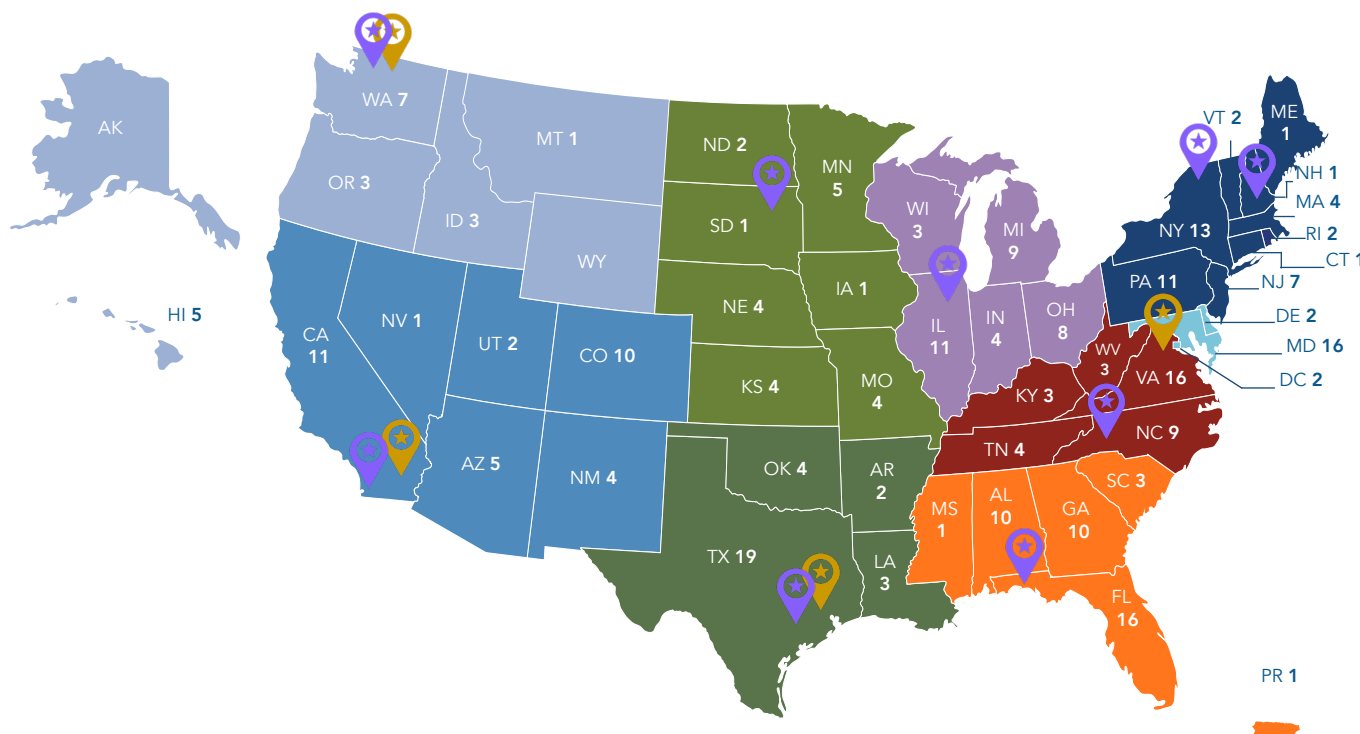
**CAE**  
IN CYBERSECURITY  
COMMUNITY



For more information, please visit [caecommunity.org](http://caecommunity.org)



This map includes institutions designated as CAE-Cyber Defense and Research (274).



### CAE National Resource Centers

**CAE Community** - California State University, San Bernardino (CA)

**Mentors** - Whatcom Community College (WA)

**Reviewers** - Northern Virginia Community College (VA)

**Knowledge Units** - University of Houston (TX)

**274 CAE Designated Institutions**



### CAE Regional Resource Centers

- North Western Region** - University of Washington (WA)
- South Western Region** - Coastline Community College (CA)
- South Central Region** - San Antonio College (TX)
- North Central Region** - Dakota State University (SD)
- Mid Western Region** - Moraine Valley Community College (IL)

- South Eastern Region** - University of West Florida (FL)
- East Central Region** - Forsyth Tech Community College (NC)
- National Capital Region**
- North Eastern Region** - Mohawk Valley Community College (NY)
- North Eastern Region** - Northeast University (MA)

The CAE in Cybersecurity Community is a grant project managed and staffed by the 501(c)(3) non-profit University Enterprises Corporation (UEC) in partnership with California State University, San Bernardino.

# INNOVATIVE STUDENT FACULTY RESEARCH



## AUTOMOTIVE CAR RESEARCH CAR HACKING

The Information Security Research and Education (INSuRE) collaborative is a network of national Centers of Academic Excellence in Cyber Defense Research (CAE-R) started at Purdue University that cooperates to engage students in solving applied cybersecurity research problems. Small groups of CSUSB students have engaged in research regarding car hacking and autonomous vehicle security since spring 2018. The NSA and national laboratories provide support by contributing suggested problems and also by providing technical directors to mentor student groups. Students work on real problems in national information security with the support of federal agencies. Through the project, students have gone on to internships with Argonne National Laboratory.

## PATHWAY PARTNERSHIP WITH PRIVATE SECTOR FACEBOOK SCHOLARS PROGRAM

Our growing partnership with Facebook has resulted in a Web Systems Security class for credit which is designed as an integral part of our pathway program. Dozens of students have completed the course to date and have gained access to opportunities such as internships, scholarships, and conference sponsorships. Taught by CSUSB faculty, students learn the basics of cybersecurity, common vulnerabilities, and attacks, while receiving hands on practice in both exploitation techniques and strategies for protecting/hardening applications.





## GOOGLE CLOUD

Google provided students at CSUSB with \$5,000 to work on a Google Cloud Rover Project involving a virtual emergency security operations center (ESOC). Students presented the virtual ESOC to Google while attending a summer conference. The Cloud Rover research project demonstrates the possibilities of the latest cloud technology to help prepare students to obtain cloud engineering certifications. Students get hands-on practice by exploring voice commands and a variety of topics, including IoT (Internet of Things), AI and machine learning, programming, NoSQL database construction, cloud networking, and cloud security. The student team was invited by Google to showcase this project at Google Cloud Next 2018.

## VIRTUAL REALITY SECURITY OPERATIONS CENTER

The Virtual Reality Security Operations Center (VR SOC) project is a virtual recreation of a real-life security operations center, using virtual reality headset technology to “place” users into a virtual operations center where they can view information about the current events of an organization and securely communicate with others about what’s going on. The project involves over a dozen students using virtual technology in a real-world environment. The innovation of the project prompted the US Army Command to visit the student lab for an in-person, hands-on overview, and project leaders have secured federal cybersecurity positions based on the interest in this project.

# COMMUNITY COLLEGE CYBER PILOT PROGRAM (C3P)

CSUSB helps spearhead NSF's new pilot project that addresses the cybersecurity workforce shortage by extending their renowned scholarship program to community colleges across the nation.



Working closely with Whatcom Community College in Bellingham, Washington, the Community College Cyber Pilot (C3P) program will institutionalize the student and faculty development to support veterans and bachelor's degree holding students in successfully completing the Scholarship For Service program at five participating colleges.

**\$4.3 million** was provided by the National Science Foundation (NSF) to support the success of the pilot project for three years (2019-2022). The C3P program will utilize student educational portfolios toward professional development and test student Knowledge, Skills, and Abilities (KSAs) on the National Initiative for Cybersecurity Education (NICE) Workforce Framework.

Students receiving scholarships will take part in an apprenticeship-like, cohort-based program known as the C3P program, where they will develop and focus on IT skills, computer science, intelligence, national security, criminal justice, and other cybersecurity related skills. In addition to professional development mentorship that prepares them for the workforce, the C3P scholars will participate in a series of boot camps, a research project, and a variety of development activities that expose them to hands-on application of their knowledge and skills.





CSUSB's C3P program will help protect American security and economic prosperity through the development of an innovative and efficient education system that will produce an elite 21st-century cybersecurity workforce as well as a cyber-informed citizenry.

**"We know that community colleges play an important role in providing essential academic and training opportunities to a wide range of individuals. The awards made through the C3P program will provide scholarships and create professional pathways for both veterans of the Armed Forces and for bachelor's degree holders who want to pursue careers in cybersecurity."**

**–Karen Marrongelle, NSF assistant director for Education and Human Resources**

The Community College Cyber Pilot program is a grant project managed and staffed by the 501(c)(3) non-profit University Enterprises Corporation (UEC) in partnership with California State University, San Bernardino.



# AVAILABLE DEGREES

**M.S. Information Systems Technology**

**M.S. Cybersecurity Online (Fall 2020)**

**M.B.A. Cybersecurity Focus**

**M.P.A. Cybersecurity Concentration**

**M.S. National Cybersecurity Studies**

**B.S. Information Systems and Technology, Cybersecurity Option**

**B.S. Information Systems and Technology, Intelligence Option**

**B.A. Criminal Justice, Crime Analysis Option**

**Certificate in Cybersecurity**

# SECURE YOUR CAREER TODAY

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